NOTE XXXVIII.

CARCINOLOGICAL STUDIES IN THE LEYDEN MUSEUM.

BY

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N°. 2.

Ocypode ceratophthalma, Pallas.

Ocypode ceratophthalma, Milne Edwards, Annal. Scienc. Nat. 1852, p. 141. Hilgendorf, in: Baron von der Decken's Reisen in Ost-Afrika, p. 82.

The Leyden collection contains: 1°. eleven specimens, collected on the shores of Nossy-Faly near Madagascar, 2°. three from the island of Xulla-Bessy (Moluccas), 3°. one from Amboina, 4°. eight (5 ♂, 3 ♀) from Amoy (China), presented by Mr. G. Schlegel, 5°. one from the Philippines, collected by Semper and presented by the Göttingen Museum under the name of *Ocyp. longecornuta* Dana. — All these specimens, though positively belonging to the same species, present however some remarkable varieties.

The terminal spines of the eyes are very long and strong in the adult males, becoming gradually smaller in younger specimens *(Ocyp. urvillei Guérin)* and being only tuberculiform even in the adult females; their relative thickness however presents individual varieties, these spines being slender and tapering in the Nossy-Faly and Amboina specimens, but thicker in the Amoy individuals, and in the large adult male specimen of the Philippines they are a little shorter but rather thicker than in the Amoy forms, the crabs agreeing for the rest wholly with one another. There are patches of thick hair on the under surface of the penultimate joints of the *second* and *third* legs and the musical ridge on the inner surface of the larger hand of the male consists of numerous small secondary transverse ridges, that are more crowded on the under half of the ridge but separated by larger intervals on the upper half and change even gradually into small tubercles at the upper end.

This species however presents many most remarkable (perhaps local) varieties as regards the general physiognomy of the upper surface of the carapace, caused by a different course of the lateral margin of it, varieties that seem to have been regarded by Milne Edwards and others as different species. In all specimens however the external orbital angles, directed transversely outward, do not project beyond the bottom (»fond" Milne Edw.) of the external portion of the very oblique supraorbital margin and are situated very much behind the bottom of its internal portion. But the epibranchial angle, that lies there where the lateral margin is crossed by the oblique granular line on the lateral surfaces of the cephalothorax, projects more or less outward than the external orbital angle. So in the Nossy-Faly and also in the Xulla-Bessy specimens the external orbital angle projects more outward than the epibranchial, the lateral margin being therefore nearly straight and directed obliquely backwards, but in the adult Amoy specimens and in that of the Philippines the epibranchial angle projects more than the external orbital, the lateral margin being consequently more arcuated, the whole upper surface of the carapace appearing to be broader than that of the Nossy-Faly specimens. To this variety with relatively broader carapace perhaps belong the *Ocyp. platytarsis* Lam. and *Ocyp. brevicornis* M. Edw. But the specimen of Amboina and even a young from Amoy present a remarkable transition, the external orbital and the epibranchial angles equally projecting outward.

For the rest, as regards the shape of the hands, of the musical ridge, of the abdomen, of the legs, these varieties wholly resemble one another.

Ocypode aegyptiaca Gerst.

Ocypode aegyptiaca, Gerstaecker, Archiv. f. Naturg. XXII, pag. 134.

The Museum contains nine fine specimens collected at Djeddah by Mr. Kruyt (8 ♂, 1 ♀) and two others also from the Red Sea, presented by Mr. Kossmann under the name of the preceding species. These two species are however quite different ones. *Ocyp. aegyptiaca* constantly and really differs from the *ceratophthalma* Pallas, 1° by a quite other shape of the cephalothorax, 2°. by the patch of thick hair occurring only on the penultimate joints of the *second* legs, 3°. by the long musical ridge of the male, the transverse secondary lines being *equally* and very much crowded over the whole length and very delicate.

The terminal spines of the eyes are very slender and tapering, and long both in the adult male and adult female, becoming tuberculiform and even quite disappearing in the young. The upper surface of the carapace is very convex in a longitudinal sense, everywhere granulated, more coarsely on the lateral regions, the front being large, truncated and granulated, the supra-orbital margin minutely denticulate. — The external orbital angle is rather obtuse, that part of the lateral margin which lies between the external orbital and epibranchial angles being convex, projecting more outward than the first called angle, and minutely denticulate; the posterior part of the margin, like the ridge that occurs on the lateral surface of the carapace are granular. The large hand is a little higher than in the preceding species, the under margin being more convex and coarsely denticulate, the upper margin more acute than in *ceratophthalma*. The dactylopodites are rather broader than in the preceding species.

In young specimens the external orbital angle is a right one, and the musical ridge is quite developped.

Ocypode cursor Belon.

Ocypode cursor Belon, Milne Edwards, Annal. Scienc. Nat. 1852, p. 142.

In this species, two adult male and several young specimens of which from the Congo coast were presented by Mr. P. Kamerman, Officer of the Dutch commercial company on the Congo coast, the musical ridge, tapering at both its ends, consists of many transverse delicate lines, like in *Ocyp. aegyptiaca*, that are equally crowded over its whole length. We received also a fine male from Acra d'Elmina.

Ocypode arenaria Catesby.

Confer: S. I. Smith, Crustacea on the Coast of new England in: Transactions Connecticut Academy, Vol. IV, July 1880, p. 254.

We received a fine male specimen from the shores of the island of Curaçao. The musical ridge consists of a series of very small round *tubercles*; the external orbital angle projects even beyond the rounded prominence on the supraorbital margin. This species may be distinguished at first sight by the long hairs, with which the ambulatory legs are clothed.

Ocypode cordimana Latr.

Ocypode cordimana Latreille, Milne Edwards, Alph. Milne Edwards, Nouv. Arch. du Musée, T. IX, pag. 271, Hilgendorf, l. c pag. 82. Nec *Ocyp. cordimana* de Haan, Fauna Jap. Crust. p. 57, Tab. XV, fig. 4.

The Museum contains 33 specimens, collected at Amoy by Mr. G. Schlegel[1]), one adult female specimen from the island of Xulla-Bessy, four specimens (2 ♂; 2 ♀) from the shores of Shanghir and one fine male individual, collected at Bezoeki (Java) by Mr. Semmelink. All these specimens wholly agree with one another.

This common Indian species may be distinguished from all other species of *Ocypode*, 1°. by the eyes being devoid of terminal spines even in the adult, 2°. by the inner surface of the larger hand having no trace of a musical ridge both in the male and in the female and 3°. by the shape of the cephalothorax and of the legs. The description of this long known form being still ever insufficient, it will be allowed to give another one.

The cephalothorax is very high and thick; its upper surface extremely convex longitudinally, everywhere granulated, the granules being somewhat coarser on the lateral portions and on the front. Front with a minute triangular median incision on its anterior margin. Supraorbital margin transverse with a rounded prominence on each side of the front, with the acute external orbital angles directed forward, projecting beyond the described prominence and beyond the base of the front. The epibranchial angle projects beyond the external orbital and that part of the granulated lateral margin, that lies between these two angles, is convex; behind the epibranchial angle the lateral margin is rather a little concave and does not proceed till the posterior margin of the carapace but ceases at some distance from it. The minutely denticulated suborbital margin is separated by a deep incision from the external orbital angle, and the internal suborbital tooth is acute and granulated. Pterygostomian regions convex and granulated. Internal inferior margin of the arms provided with a denticulated crest. The sternum is less granular than that of *Ocyp. ceratophthalma* and the various joints of

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1) These Amoy specimens were labelled by Mr. Herklots as *Ocypode grossimana* Herklots; happily, as far as I am aware, this name never has been published, for they belong all to the common *Ocyp. cordimana* Latr.

the male abdomen are comparatively broader, less elongate than in that species. The external shape of the hands very much agrees with that of the hands of *Ocyp. ceratophthalma* Pallas, but the tubercles on the upper margin of the larger hand and on the upper margin of the mobile finger are less spiniform, more depressed. The penultimate joints of the second and third ambulatory legs are provided with a patch of hairs on the under surface and the dactylopodites are rather broad and clothed with hairs on the margins.

As regards the geographical range of our species, it occurs positively on the shores of Zanzibar, Java, Xulla-Bessy, Sanghir, New-Caledonia and Amoy, so that it is found in the whole Indian Ocean and Malayan Archipelago. —

The *Ocyp. cordimana* of de Haan was founded upon a young specimen of *Ocyp. ceratophthalma* Pallas, as I can positively affirm: young specimens of the latter species, collected at Amoy, having the carapace 19 millim. broad, not only wholly agree with the description and the figures of de Haan's *cordimana*, but even with the typical specimens of the author of the *Fauna Japonica*, found back by me in the Leyden Museum.

Ocyp. convexa Stimpson (Proc. Philad. 1858, p. 100) from Japan, will be allied to our species, when not identical, for its insufficient description is nearly wholly applicable to the *Ocyp. cordimana* Latr.

The description of *Ocyp. cordimana* Latr. in Milne Edwards, Hist. Nat. des Crustac. pag. 45 without any doubt is wrong, and it will be difficult to explain this fault; Alph. Milne Edwards however has rectified the description of this species, when describing his specimens from New Caledonia.

Ocypode kuhlii de Haan.

Ocypode kuhlii de Haan, Fauna Japonica, Crustacea, p. 58.

I only found two specimens of this beautiful, apparently rare species, a nearly adult male, collected by Kuhl and van Hasselt on the shores of the island of Java, and another fine adult male, also from the Indian Archipelago, the former specimen being the type of de Haan's short description.

In its outward appearance, the cephalothorax very well resembles that of *Ocyp. arenaria* Catesby from the West-Indies, being broader than long, the breadth of the upper surface being in proportion to the length as 4 : 3. Like in *Ocyp. arenaria* Catesby and in *Ocyp. cordimana* Latr., the acute external orbital angles project beyond the rounded prominence of the supraorbital margin, but are directed *outward* and not inward as takes place in the two quoted species. The epibranchial angle projects more outward than the orbital angle and the granulated lateral margins are therefore convexly arcuated, though being rather concave immediately behind the triangular external orbital angles. The front is much deflexed and arcuated anteriorly, with a minute median triangular incision at its anterior margin. The upper surface of the carapace is much convex longitudinally and granulated, more coarsely on the lateral portions than in the middle. Suborbital margin minutely denticulated; internal suborbital tooth denticulate. Convex pterygostomian regions coarsely granulated. External surface of the external maxillipedes a little granulated. Peduncles of the eyes *without* any trace of terminal prolongation. External surface of the sternum and of the male abdomen minutely granulated, the first segment of the sternum (between the anterior legs) armed with two granulated ridges on each side. Anterior legs very unequal in size; arms as in *Ocyp. cordimana* Latr., upper margin rounded and transversely rugose, internal and external margins of the smooth under surface armed with dentiform tubercules. External rounded margin of the carpopodite granular, internal angle denticulate. Hands *much compressed and more elongate* than in *Ocyp. cordimana* Latr., the upper margin of the palm of the large hand being rather longer than the height of the rather little convex external surface; upper margin of the palm rounded and coarsely granulated, like also the upper margin of the compressed mobile finger, immobile finger much compressed, a little longer than the upper, with concave under margin that passes into the somewhat convex denticulate under margin of the palm. Internal surface granular inferiorly and provided with a musical ridge, composed out of some few (8 or 10) small ovoid tubercles arranged longitudinally. Smaller hand much compressed and elongate, external surface granular, under margin denticulate. Upper margins of the meropodites of the ambulatory legs transversely rugose, under margins granulated; the following joints with two granular ridges on the external surface, penultimate joints transversely rugose on the outer and inner surfaces, *without* patches of hairs on those of the second and third legs (as are found in *Ocyp. cordimana* Latr.); dactylopodites rather broad, more enlarged than those of *Ocyp. cordimana* Latr., with the external surface pubescent and having both margins provided with some hairs near the base.

Measurings of the adult specimen:

Distance between the external orbital angles 38 mm.

Distance between the epibranchial angles 43 mm.

Length of the carapace 33 mm.

Length of the upper margin of the palm of the larger hand 22 mm.

Length of the whole larger hand 45 mm.

Heigth of the larger hand near the articulation of the mobile finger 21 mm.

This species may be distinguished from *Ocyp. cordimana* Latr., (both having the eyes without terminal prolongation), by the different shape of the carapace, the elongate chelipedes, the existence and the structure of the musical ridge, the under surface of the penultimate joints of the second and third legs being devoid of hairs, etc.

The quoted insufficient and ambiguous description of

Ocyp. convexa Stimpson, is also somewhat applicable to this species, and perhaps also *Ocyp. laevis* Dana may be allied to our form, (the description of the latter is not in my hands) or even identical, but in all cases the name of *kuhlii* must have the priority.

Ocypode africana n. sp.

A single fine male specimen of this inhabitant of the shores of tropical West-Africa from Liberia to the Congo was presented by Mr. P. Kamerman, who made already several very interesting collections for our Museum. This species was already known to Mr. Hilgendorf (l. c. pag. 81), whose specimen was from Liberia, but he did not describe it; our individual was found on the shores of the Congo coast.

In its outward appearance this species extremely resembles the Indian *Ocyp. cordimana* Latr., from which it is however at first sight distinguished by the occurrence of a musical ridge on the inner surface of the larger hand, and our species must be regarded as the representative of that Indian species in the seas of West-Africa.

Upper surface of the cephalothorax very convex longitudinally, everywhere covered with minute depressed granulations; front very much deflexed, granular; external orbital angles extending as far as the rounded prominence of the supraorbital margin, directed inward, though not so much as in *Ocyp. cordimana*, at least in the specimen before me; that part of the minutely granulated lateral margin, that lies between the epibranchial and orbital angles a little convex, the posterior part directed obliquely afterwards; epibranchial angle projecting a little more outward than the orbital angle, and situated more forward than in *Ocyp. cordimana*, that portion of the lateral margin which lies between the epibranchial and orbital angles being relatively shorter in proportion to the whole lateral margin than in the Indian representative of our species. Eyepeduncles without any terminal prolongation. Lateral surfaces of the cephalothorax smooth, pterygostomian regions convex and coarsely granulated; suborbital margin granulated, with a small incision near the middle, covered with some hairs and making a nearly straight angle with the external orbital angle. External surface of the outer foot-jaws a little granulated and hairy. Sternum punctate, first segment (between the chelipedes) a little granular. Male abdomen much narrower than that of *Ocyp. cordimana*, terminal segment triangular as long as broad, second segment rather somewhat longer than broad at the base, with the lateral margins much *arcuated* outward, and therefore having a very characteristic shape, both segments minutely punctate; third segment quadrangular, punctate, rather longer than broad, with the lateral margins nearly straight; fourth segment quadrangular, more than twice as broad as long, a little granular, like also the three remaining basal segments, that have nearly the same shape as in *Ocyp. cordimana.*

Chelipedes very unequal in size, almost wholly agreeing as regards their shape and structure with those of *Ocyp. cordimana* Latr. Musical ridge extending from near the granulated inferior margin till near the upper angle of the articulation of the mobile finger, composed out of delicate transverse lines that become gradually narrower towards the upper part of the ridge, but do not change into tubercules. Internal surface of the large hand granulated; under surface of the trochanters of both chelipedes armed with a linear tubercle striated longitudinally, that serves as a fiddlestick for the musical ridge, that of the larger trochanter being longer than the other. Upper margins of the meropodites of the ambulatory legs transversely rugose. Under surface of the penultimate joints of the second and third legs without patches of hairs, distal part of the external margin of the under surface of the penultimate joints of the third legs hairy; some few hairs on the under margins of the meropodites. Dactylopodites more slender than those of *cordimana* Latr., hairy on both margins, the ambulatory legs having for the rest the same shape and structure as those of that Indian species.

Measurings of our specimen:

Distance between the external orbital angles $27^1/_2$ mm.
Distance between the epibranchial angles 29 mm.
Length of the carapace $22^1/_2$ mm.
Length of the larger hand 21 mm.
Heigth of the larger hand 12 mm.

Macrophthalmus depressus Rupp.

Macrophthalmus depressus, Ruppell, Krabben, p. 19, Taf. IV, fig. 6.

Milne Edwards, Ann. Scienc. Nat. 1852, p. 159.

Four specimens were collected at Djeddah. This species is most closely allied to *Macrophth. japonicus* de Haan, but may be distinguished by the following: our specimens at least are of a smaller size than that of *Macrophth. japonicus*, the breadth of the carapace being 21 mm., that of the Japanese form 32 mm., but the shape and structure of the cephalothorax are nearly quite the same in both species. The external surface of the hands of the male is a little more convex, its inferior margin being less arcuated and being rounded, while in *Macrophth. japonicus* it is much arcuated, rather acute and granular. The convex internal surface in the Japanese form is a little granular near the articulation, but closely covered with many hairs in *depressus*; the upper margin of the mobile finger granular in *japonicus*, but rather smooth in the other, and the tooth with which its inner margin is armed, is broader in the Red Sea form. Finally the under surface of the meropodites of the three middle legs and the internal surface of the tibiae and tarsi of the fourth pair are closely covered with hairs in *depressus*, but nearly smooth in the other.

Leucosia urania Herbst.

Eight specimens were collected at Djeddah, Red Sea. They agree wholly with the typical specimen of *Leuc. neocaledonica* Alph. M. Edw. from New-Caledonia, that I described for some time to be identical with *Leuc. urania* Herbst (Notes Leyden Museum, Vol. III, p. 123). The upper margin of the palm of the hands in our specimens is cristate, it being more rounded in the New-Caledonian specimen, but it may be attributed to the larger size of that individual. There are two dark spots on the posterior surface of the carapace.

Leyden, Sept. 1881.